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Canada Atomic Energy Control Board, special  
" Committee on the operations of, 1949

1949

SECOND SESSION

HOUSE OF COMMONS

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SPECIAL COMMITTEE  
ON THE  
OPERATIONS  
OF THE  
ATOMIC ENERGY  
CONTROL BOARD

MINUTES OF PROCEEDINGS AND EVIDENCE

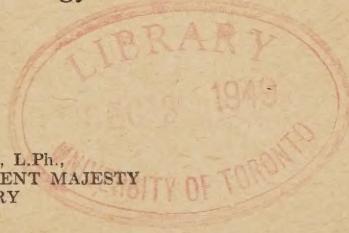
No. 4

THURSDAY, NOVEMBER 24, 1949

WITNESS

Dr. C. J. Mackenzie, President, Atomic Energy Control Board

OTTAWA  
EDMOND CLOUTIER, C.M.G., B.A., L.Ph.,  
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY  
CONTROLLER OF STATIONERY  
1949





## MINUTES OF PROCEEDINGS

THURSDAY, November 24, 1949.

The Special Committee appointed to examine into the operations of the Atomic Energy Control Board met at 11.30 a.m. The Chairman, Mr. McIlraith, presided.

*Members present:* Messrs. Breithaupt, Brooks, Bourget, Gibson (*Comox-Alberni*), Green, Kirk (*Digby-Yarmouth*), McCusker, McIlraith, Murphy, Pinard, Stuart (*Charlotte*), Winkler.

*In attendance:* Dr. C. J. Mackenzie, President, and Mr. G. M. Jarvis, Secretary, Atomic Energy Control Board.

Dr. Mackenzie was recalled and further examined.

On motion of Mr. Kirk, seconded by Mr. Murphy,

*Ordered*,—That 500 copies in English and 200 copies in French of this day's Minutes of Proceedings and Evidence be printed.

At the conclusion of Dr. Mackenzie's evidence, the room was cleared and the proceedings were continued *in camera*.

The Committee adjourned to meet again at the call of the Chair.

R. ARSENAULT,  
*Clerk of the Committee.*



## MINUTES OF EVIDENCE

House of Commons,  
November 24, 1949

The Special Committee appointed to examine into the operations of the Atomic Energy Control Board met this day at 11:30 a.m. The Chairman, Mr. G. J. McIlraith, presided.

The CHAIRMAN: Order, gentlemen. When we adjourned on Tuesday we were discussing questions arising out of our two day visit to the Chalk River plant, and, at the close of the meeting the matter of the relation to industry of the whole development had been raised. Are there any further questions on the subject?

Mr. MURPHY: Mr. Chairman, I wonder if Dr. Mackenzie would like to comment on anything that he saw in the news this morning. I noticed that the Ottawa *Citizen* ran an article "Lilienthal quits U.S. post"; and certain reasons are given. Would that incident have any bearing on information which, shall I say, can be exchanged in relation to the agreement between the different countries.

**Dr. C. J. Mackenzie, President of The Atomic Energy Control Board, recalled:**

The WITNESS: I would not think so. That is a personal matter; but I have seen what you have seen. I heard a radio broadcast, as well, indicating that Mr. Lilienthal had resigned. I have no idea what is behind it.

Mr. MURPHY: There is another matter reported in the same paper—"Plutonium produced by French project". Have we an arrangement with France similar to the one we have with the United States?

The WITNESS: No. The work in France is, I believe, unclassified. I was in Paris last year and was invited to go to their plant. It is a very small plant. They had a very small reactor in which we have not much interest because we are far beyond that stage. We know the people who are working there very well.

*By Mr. Bourget:*

Q. Are they working in close relation with Russia or are they working alone?—A. I cannot answer that. I would say that the plant is of such low power that it has no significance at present. Their pile is the equivalent of the little ZEEP that we put into operation within a very few months of our commencement in the field. It is a very low energy pile and it has no significance outside of the first stage.

Q. Is it a heavy water pile or a graphite pile?—A. I cannot answer that at the moment. I should know, and I was immediately going to say that it is a heavy water pile, but I had better not do so. The Paris laboratory worked on heavy water just before the war, or just as war broke out, and my inclination is to say that it is a heavy water pile but I had better not go that far.

*By Mr. Breithaupt:*

Q. In inviting the group of manufacturers to the plant a number of years ago, or last year, how did you arrange your invitation?—A. They were not invited to the plant. You are referring, I presume, to the industrial conference that was held in Ottawa.

Q. Well, who had the privilege of attending and how was the list chosen?

The CHAIRMAN: I think a complete list of the representatives attending is given in the document filed at our last meeting. We tabled the proceedings of that meeting.

The WITNESS: I was trying to get the information Mr. Breithaupt wanted—the exact machinery of how we got in touch with industry.

*By Mr. Breithaupt:*

Q. Yes.—A. I will submit that information to you. The fundamental intention was to get all industries represented which had scientific or technical officers, and industries that might have been interested. We did not want to get a group of executive officers such as presidents and vice presidents at the conference who had no scientific knowledge. We wanted to have a round table discussion by technical people who might know the technical and scientific plans of industry. That was the general scheme.

Q. I suppose there were chemists from the industries that had laboratories?—A. Yes, directors of research laboratories and so on. If a company director or president was interested he would have attended. For instance, we did have presidents of companies at the conference, and I think the presidents of the Frosst Pharmaceutical Company was interested. The Merck Company in the United States has as its president a chemist but, we did not have representatives from any American companies present. I am trying to point out that we did not limit attendance in any way other than the matter of scientific or technical interest.

Q. In other words I suppose it was a good cross section of people in Canada who would be interested?—A. We had 150 people there and it would be a pretty good cross section.

Q. Regardless of the size of the industry?—A. Yes. We had no intention of preventing anyone from coming, and what we were trying to do was to make sure that we had good representation. We did not try to exclude anyone.

*By Mr. Murphy:*

Q. Was the oil and automotive industry represented?—A. The Chrysler Corporation was represented, but I cannot say what others.

Q. How about the oil industry?—A. The oil people are very interested. As you know, the Imperial Oil Company is doing some work in Sarnia. This is information I have not got in an authoritative way but I understand they are interested in doing some work and are working with one of the universities. The oil companies are interested in the over-all picture.

I have some further information, Mr. Chariman, which we obtained after the last meeting. We did not realize how interested you were in this participation of industry and, as I tried to indicate on the last day, you cannot rate participation by the amount of isotopes that have been demanded because there is a very long period of study required. When I returned to my office I asked the Chalk River people to give us what information they had as to what the interest by industry might be. I think you might be interested in the answer we got. Five companies have applied for and received shipments of cobalt 60; four companies have ordered Cobalt 60, their plans have matured to the point where they have ordered; eleven companies have made inquiries about cobalt, and the inquiries may result in orders; seven companies have made inquiries

about the use of isotopes to deal with specific problems and those are being worked on; four companies have consulted Chalk River about programs of isotope utilization; twelve companies have presented problems to Chalk River but it was found that isotopes were not suitable for the purposes which they had in mind. In addition, we know by hearsay of at least four other companies that are working on isotopes but who have not been in consultation with Chalk River for advice or by way of direct application. If you put those all together you have forty-seven companies that we know are interested in this field. If you apply the fifteen to one ratio that would be the equivalent of about six hundred companies in the United States. I think that is a picture which is more representative than the simple answer given to the question of how many have ordered isotopes.

Mr. GREEN: Did you have representation from the medical profession attending this conference in Ottawa?

The WITNESS: We have had the medical people in on many, many, conferences. The medical people and the biological people are more interested in this field than perhaps any other groups. By far the largest proportion of isotopes we have delivered has gone to hospitals and medical schools for research. I would say that the biological and medical institutions in Canada are very much in the picture at the moment.

The CHAIRMAN: There is just one part of Mr. Murphy's question that remains. He asked about automotive companies attending the conference and I notice from a quick glance of the ones purported to have attended, that three companies at least, General Motors, Ford, and Chrysler were represented. There may have been others. I noticed that some of the other oil companies attended as well, for instance, Shell and I also notice a tire company.

Mr. BREITHAUPt: Was that a Canadian tire company?

The CHAIRMAN: Dunlop Tire and Rubber Goods, Toronto.

Mr. MURPHY: Was Polymer represented?

The WITNESS: Polymer is carrying on experimental work. I do not know whether it was represented that day or not, but Polymer is carrying on the work with isotopes. A lot of government departments are also using isotopes. Polymer is one of four companies using isotopes which I mentioned.

*By Mr. Briethaupt:*

Q. In connection with rubber companies I understand that one company in the United States has actually perfected a gauging instrument that is in constant use there. It is based on the experiment you showed us the other day on the thickness of paper. The same principle is applied to rubber.—A. Yes, and you can buy commercial equipment to do that work today.

Q. I see.—A. It is in the stage of the development when you would have to be sure that the specific problem in which the company is interested is of a type that the equipment was designed for.

The CHAIRMAN: In answer to your question, Mr. Murphy, I find that Polymer was represented. I also notice that another tire company, the Dominion Rubber Company of Guelph, attended.

Mr. BREITHAUPt: The Dominion Rubber Company is located at Kitchener.

The CHAIRMAN: Yes, I stand corrected.

Mr. PINARD: Did you have any pulp and paper companies represented?

The CHAIRMAN: Yes, many of them.

*By Mr. Pinard:*

Q. What would be the use of isotopes in the pulp and paper industry?—A. I am not an expert on the matter. That is why we called the conference—

to expose the general type of things that these isotopes can do—and then leave it up to industry to determine whether they have any specific uses for them. One could think of determining the thickness of paper as one of the uses, for gauging, and perhaps for control. Also, I think I am correct in saying that the problem of static which develops with paper is an important problem.

Q. I understand that the Mont Rolland Pulp and Paper Company is using uranium isotopes to destroy the static on paper going through the equipment?—A. Yes, but if my information is correct they are not using uranium; they are using radium. It is the same sort of principle—merely the discharge of the electrical charge on the paper. Then, it is possible to do all sorts of things by remote control. You can determine or gauge the height or levels of liquids in tanks without having to have an instrument inside the tank. You can carefully determine the strength of liquids and their specific gravity. You can follow the proportion of various ingredients and you can do so many things that it is almost impossible for anybody who is not in intimate touch with an industry to answer the question specifically.

Mr. WINKLER: Are any universities working on the use and application of isotopes to industry?

The WITNESS: That is something, Mr. Winkler, which I cannot say because we do not know everything the universities are doing. The indirect information which I received yesterday, and which I did not have before, is that some of them are doing so. I am not informed on that except indirectly. They would not have to report to us but probably in our whole organization it would be known. Some individuals in our organization would probably be in contact with specific universities, but I personally would not be and I could not hope to know what was going on in all the universities in a detailed way.

*By Mr. Murphy:*

Q. Are those industries—those engaged in research—in contact with your department?—A. I have given the table showing the ones which have applied for isotopes. There are nine which have either received or ordered isotopes and they would have to have a business or contractual relationship with us, but there are thirty-four which have been in correspondence with us, putting their problems up to our people.

Q. They put their problems forward with the idea of getting information?—A. Yes, just in the way that anyone might write to a firm asking for suggestions.

Q. The point I am making is whether the inquiries are followed up? Are the industries continually in communication with you or with your department respecting their research?—A. That would be entirely up to the industry and I could not answer that question. If the industry found it advantageous it would probably do so, but, as far as we are concerned, we give them all the help we can.

Q. Is there any suggestion that another conference similar to the last one should be held?—A. Well, we have that in mind but have not made any precise plans about the date. I think it would be well to have another conference, but, as in all these things, we have a great deal of work to do in preparation and we are willing and happy to do that work if the interest is there. The normal way we would operate would be to discuss it with the industries we are in contact with and get their views as to the desirability of holding another conference. If we find a general desire we will arrange the conference.

Mr. BROOKS: Are any industries expressing any concern—and I am thinking of oil companies, Hydro Electric companies, or coal companies—that they may be driven out of business in future years by atomic energy?

The WITNESS: Of course, you see that expressed in newspapers from time to time but I do not think any well informed power people are worrying very much about it at the moment. That is an opinion only.

MR. GREEN: You think there is unlikely to be a conflict of interest?

THE WITNESS: I do not think that anyone can foresee anything in the immediate future that would put Hydro Electric power plants or ordinary central power stations out of operation. You will find most people thinking in terms of power plants in remote places where power is not available, or where the expense of getting fuel in would be very great. The United States has indicated that they have a project for the development of a power plant for naval vessels. Obviously that would be of advantage but I do not think it would have much significance competitively.

*By Mr. Stuart:*

Q. You are doubtless familiar with the Quoddy power project?—A. I know where Quoddy is.

Q. Very recently I had information to the effect that the project may be held up owing to the fact that we are pretty much convinced that atomic energy may replace water power. Now what, in your estimation, is the possibility?—A. That is a little bit beyond the scope of the Atomic Energy Control Board.

Q. Your reply to Mr. Brooks would indicate that there is no danger of hydraulic power being replaced by atomic energy?—A. I do not think I would like to give an opinion beyond what I have already said.

*By Mr. Brooks:*

Q. I noticed that when they exploded the bomb at Bikini the battleships became radioactive and that scientists have not been able to eradicate the radioactivity from the material. That is one reason why it is thought that large battleships may not be used in future wars. I wonder if there is anything that can be done to remove that radioactivity from battleships?—A. I would say again that is technical. I think that if a battleship got hit in action by an atomic bomb—

Q. These ships were not hit.—A. No, but that is what I am leading up to. That was a test made in a confined body of water in which these battleships rested. That would not be a situation one would envisage for war. It was not the bomb hitting directly, it was the water that the ships were in that had become radioactive.

Q. But the ships themselves became radioactive and the men could not stay on them?—A. Oh, undoubtedly the after effects are there, and the reports of what happened in Japan, of course, are quite extensive.

Q. But evidently there has been nothing developed yet that can remove it?—A. No.

THE CHAIRMAN: There is one question that occurs to me. There has been some discussion about what we in Canada are publishing in this respect. I have here two publications showing the published papers in 1947 and 1948. The title of these volumes is "National Research Council of Canada Atomic Energy Project—Published Papers, Volume I, 1947, and Volume 2, 1948." They are purely scientific papers and I do not think they are of any interest to the committee. I am however bringing to your attention the fact that they are being published. I think the committee would be interested if Dr. Mackenzie would say a word about them.

THE WITNESS: Mr. Chairman, these volumes which you see here are merely compilations of papers that have appeared in scientific journals. As you know all scientists publish or try to publish all their work in a scientific journal. A scientist would never dream of putting out a book like this on his original work because he would get no credit for it. These volumes merely bring together for the use of the people at Chalk River all the published papers in connection with this subject. I think there were something like a hundred papers published in

the two years covered by these two volumes. For instance, I will read the first item of the contents of Volume I—"Analytical Chemistry—Determination of Thorium and its Separation from Uranium by Ferron, by D. E. Ryan, W. J. McDonnell and F. E. Beamish (June 1947)" and here is another one from the British Journal of Radiology, Volume XIX—"Applications of Recent Advances in Nuclear Physics to Medicine—by J. S. Mitchell." Most of these papers appeared in the Canadian Journal of Research.

*By Mr. Pinard:*

Q. Could I ask if these papers were all published by your people?—A. Oh, yes; they were all published by people who are or have been connected with the project. For instance, here is one by Pierre Demers, the title of which is "New Photographic Emulsion Showing Improved Tracks of Ionizing Particles". Mr. Demers was on the atomic energy project. He is at present professor of physics at the University of Montreal, but the work he did on that subject was done at Chalk River. I could go on and list any number of these. Another one of the papers listed here: Volume I, the Growth of LA 140 and BA 140 by W. E. Grummitt, J. Guérion, G. Wilkinson, and L. Yaffe. Of these authors Dr. Guérion has gone back to France and Dr. Grummitt and Dr. Yaffe are still with us.

Q. Is it the intention of the Board to keep on publishing these books?—A. These are published by the individuals as soon as the material is declassified. The individual author writes the paper, gets permission to print it, and then sends it to the journal.

Q. I refer to the compilation of these articles?—A. Oh, this is just made up so that we can have them on file in my office instead of referring to all the individual papers. Perhaps half a dozen of these volumes have been made up; that is all.

Q. They are not made available?—A. They are of interest only to scientists but I thought it might be of interest to show the committee the extent to which new material is being published in a field which is supposed to be pretty secret.

*By Mr. Brooks:*

Q. Does there seem to be an increasing sentiment in the different countries to keep atomic energy information less secret than it has been?—A. I think so.

*By Mr. Winkler:*

Q. There has been some reference to the catalogue in which the products of Chalk River were listed for sale. Would it be possible for members of this committee to have that?—A. Yes, we will have those sent to you. Do you wish all the conditions or would you just want it without the conditions under which they are sold and the precautions that have to be taken and the routine and all the details connected with the sale and handling of these items? There is quite a long document on that but perhaps you will be content with the list of the products that we are producing and the price lists and if so we can let you have that readily.

*By Mr. Pinard:*

Q. This catalogue is not sent to industry generally?—A. No, but it is sent to anyone who inquires. It would not be of any value to anybody who had not an interest. It would not be of any value to inquire about zirconium, for instance, if the inquirer did not know what zirconium was.

Q. Would it be possible for you to tell us what were the total sales of your plant of isotopes to industry?—A. Do you mean in money?

Q. What were the returns?—A. I could not tell you that offhand. I could tell you, however, it is a small figure in comparison with our costs.

Q. My idea is not to relate it to cost. It is simply to know how much money industry paid for isotopes?—A. I can tell you this that in the year 1948-49 we shipped one hundred and fifty isotopes to nineteen institutions in Canada.

*By Mr. Murphy:*

Q. The same applies in the United States; the revenue is very small?—A. Yes, it is almost negligible. I would like to make reference to the shipments in Canada and the shipments in the United States. I made this calculation after the last meeting. The shipments in the United States last year, if my calculations are correct, were about 3,500 samples to three hundred institutions. Now, if you divided that by the factor fifteen to equate it to Canadian size that would be two hundred and twenty samples to twenty institutions. In Canada we shipped a hundred and fifty samples to nineteen institutions so it is not such a bad picture by comparison. The more you look into it the more you come to the conclusion that the ratio works out pretty close. I might mention those shipments are not all to industry; they are industries plus universities, hospitals and other institutions.

*By Mr. Pinard:*

Q. Do you include in that the sales made to the United States?—A. We sell very little to the United States and they sell very little to us. I do not know how much it is but it is small, so small that one really would not think very much about it. It is the same way with the United States; perhaps there were half a dozen sales from the United States to Canada during the year.

*By Mr. Green:*

Q. Our plant at Chalk River is essentially a research project?—A. Research and development.

Q. Just what is the position that your board takes with regard to less secrecy in research work? I have here before me the latest edition of "United Nations World" for November 1949 where I find two articles under the one heading "The Future of American Atomic Research", the first of which is entitled "The Fatal Myth of 'The Secret'" written by Harold C. Urey, who is Professor of Chemistry at the University of Chicago, with the sub-heading "Two Great Scientists Speak Up Against Unreasonable Thought Control and for Freedom of Research and Discussion". The other article is entitled "Security vs. Progress", by Frederick Seitz, who is the Chairman of the Department of Physics at the Carnegie Institute of Technology?—A. I know of those articles.

Q. They are very disturbing, and if these men are right the situation may be very serious largely because there are restrictions on the distribution of information. Professor Urey points out that quite a few of the best scientists have left the United States atomic energy project because they feel that it is useless carrying on under the restrictions; and they seem to blame congress largely and the military people and the public for keeping these restrictions on far past the time when they will be of any use. What is your opinion about that?—A. I would say that all scientists deplore secrecy because their whole tradition has been one of completely free exchange of information, and science in essence has been built up and its strength is dependent upon that. Speaking broadly, scientists always dislike very much working under secrecy conditions, but they also dislike war, and yet they have to do certain things in war. Scientists have had to do work under secrecy conditions during war and I do not think any of us could object to that. I think most scientists would say that we must cease carrying over these wartime secrecy restrictions to peacetime work. Personally, I feel, and I think the majority of scientists in the United States feel that way. I could say that Urey is an extreme advocate

on one side but even the more conservative people are looking forward day by day to the gradual removal of secrecy restrictions. All our scientists would be very happy if we had no secrecy at all. That does not mean to say there should not be any secrecy, because these other issues of national security and general aspects are not really the scientists' responsibility, and I would not say that if you put it to a vote the scientists will likely say "we will immediately open up everything". They would say "we would like to and we would like to be sure that what is maintained secret is only maintained secret because there is a proven case that it is in the national interests". That, I think, is a fair statement. You will get differences of opinion among scientists. Professor Urey, one of the most distinguished scientists in the United States, is very extreme in his views. That does not say that he is wrong. I do think that I would be on safe ground in saying that practically every scientist dislikes working under secrecy conditions.

*By Mr. Brooks:*

Q. Advances in science have always been considered as international?—  
A. Yes. I do not think you win races by looking behind you. I think you have to look ahead, and scientifically and technically we in science feel that that is the way to keep ahead.

*By Mr. Green:*

Q. Of course, the disturbing features of these articles to me is that they indicate the Russians have a wide open field, they are going right ahead, and on our side our scientists are being handicapped by the fact that there are these restrictions. I do not know which is right.—A. My personal opinion—you can take it for what it is worth—is that the situation is completely the reverse and the Russians behind the iron curtain are so extremely restricted in their interchange that it is very doubtful if they can operate to anywhere near their maximum efficiency. Interchange means interchange of private views and round table discussions. How can you have that if people are not permitted to talk to each other?

(Discussion off the record.)

*By Mr. Green:*

Q. There is not much doubt that Canada would like to have far more information from the United States than she is getting.

Mr. BREITHAUPt: It might not be a good thing to have that now, with the international situation the way it is. I thought our studies had to do with the industrial and other uses that the work at Chalk River could be adapted to and not so much with the military angle.

The CHAIRMAN: Our reference is to examine into the operations of the Atomic Energy Control Board and in the main, these come down pretty well to the operations of the Chalk River project. This project, I think it was explained, is not a military installation.

Mr. GREEN: It affects such things as power.

Mr. BREITHAUPt: Yes, but in our discussion of a few minutes ago, we were going pretty far afield.

The CHAIRMAN: I think we were far afield but I would like to say that all matters of secrecy are out of order. I deliberately took that discussion off the record.

*By Mr. Pinard:*

Q. Mr. Chairman, to what extent can those documents be consulted—I mean the classified documents—if they need to be consulted by anyone in that line

of work. If university men need to look into classified documents in order to keep up with their work, are they allowed to do so?—A. They are not allowed to see a classified document unless they are specifically cleared and arrangements are made to have the work done for the project. What would happen is that a university professor might be working in cooperation with Chalk River on a project; then he would be a part of a group and in that case he could be cleared and could have access to whatever documents he would need.

*By Mr. Murphy:*

Q. Would you prefer to have the universities working with you not on such a limited basis?—A. I do not quite understand your question.

Q. The funds allocated to universities are limited. Would it not be to your advantage if the funds were increased to permit further research? You just said a moment ago that these universities are entitled to classified information.—A. I am sorry. I did not say they were entitled to it. I said whenever that material is passed it must be passed under specific agreement and for specific purposes. But let me say that, generally speaking, I personally would resist very much the universities getting into too much secret work. I think it is destructive for a university to get involved in secret work and I believe the universities feel the same way about it. We like to have them work as much as possible on work which is open and declassified and which they are set up to do and which they want to do. I would not advise setting up large secret projects in the universities if there is any other way to do it. You may find in certain specific cases that it becomes necessary, but the tendency seems to be the other way.

Q. Their ability would be available to you, would it not? It would be part of the whole scheme?—A. Yes.

*By Mr. Pinard:*

Q. How do you follow the progress of the work done by the universities in their research work?—A. Very easily and informally. We visit the universities. Our physicists know every physicist in every university in Canada. We visit them and they visit us. It is a very simple thing in Canada because we are very small. You will find in most of the departments of physics there are men on the staff who have worked in our organizations in the past. Sometimes we employ as many as a couple of hundred students during vacation and everyone knows what is going on.

The CHAIRMAN: When you say that you employ students you are referring to the Research Council?—A. And the Atomic Energy Control Board.

Mr. WINKLER: While I have not got the slightest claim to being a plant engineer, it seemed to me while at Chalk River that the plant was almost bursting its seams. Could you make any comments on that? I mean the various sections of the plant appeared to be working to full capacity, and then some. Would it not be well to consider expanding the capacity?

The WITNESS: Well, I indicated at the meeting at Chalk River what our general opinion was about that.

Mr. GREEN: Dr. Mackenzie, is there anything that you can suggest whereby we could help the project at Chalk River? I think we are all very much convinced it is a worthwhile project?

Mr. BREITHAUP: And extremely well run.

The WITNESS: Really, the thing you can do as a committee, and this I think is the real responsibility of the committee—provided you believe the project is reasonably well run and that there are no gaps that you wish to plug,—is to determine where we are going to go from here. I think probably the public should be aware of that too. We are very interested in that feature and I think it is a question that you should, perhaps, discuss in your closed sessions.

Mr. GREEN: Do you feel free to suggest where we should go from here?

The WITNESS: Yes, I do, but not in open session. I really made a suggestion in outline at Chalk River. It is not so much a matter of secrecy but it is not my business to formulate public policy. It would be very improper, even if it were not in a secret category, for me to stand up and tell the government of Canada what it should do. I think the function of those of us engaged in the work should be to give our views and then it will be up to the government and parliament to decide what shall be done. That would be my appreciation of the situation. I would hesitate very much to advocate in public what should be done, even if it were not secret.

Mr. MURPHY: Has not the committee just about arrived at the point where that phase could be dealt with?

The CHAIRMAN: Yes, I think so.

*By Mr. Stuart:*

Q. I would like to ask a question on an item appearing in the *Ottawa Citizen* this morning. It says that "the French atomic energy pile—is under the supervision of Atomic Energy Commission Frederick Joliot-Curie, a Communist—". Has he ever been connected in any way with Chalk River?—A. No, but he made some of the original discoveries without which there might be no atomic energy piles at all.

Q. That would indicate to me then that there is still perhaps a need for secrecy in connection with atomic energy?—A. As Mr. Green points out, it is stupid to hold on to secrecy after everyone else knows the facts. For instance, it would be rather unrealistic to withhold from Joliot-Curie certain fundamental things which he discovered. It is very difficult for anyone who understands the whole physical picture to say that there is much in nuclear physics that Joliot-Curie does not know.

Mr. PINARD: It is also very difficult to keep from the Russians something that they themselves discovered?

The WITNESS: The secrets are, generally speaking, of the type that industry has—how they do certain things—trade secrets if you like. As far as the theory of a pile is concerned it is declassified and actually Joliot-Curie was one of the first men who proposed the fundamental theory.

The CHAIRMAN: Are there any more questions before we go into our closed session?

Mr. GREEN: Are you having any difficulty in getting scientific men for the Chalk River project?

The WITNESS: Perhaps the best answer is that our establishment is completely filled at the moment.

*By Mr. Murphy:*

Q. What is that again?—A. Our establishment is completely filled. We have a certain establishment, like a military unit, and it is now full. We could not appoint any more people today because we have no more positions for them.

Q. Does that apply to chemical engineers, too?—A. Well chemical engineering is something we are trying to build up. The overall picture in Chalk River, however, is that we have all positions filled. We have not got enough room or houses for the people we have. I think if the scope of the project were extended and the establishment enlarged we would be able to fill further positions in time. We can not say, as we were saying two years ago, that we are badly handicapped because we can not get all the staff we want.

*By Mr. Green:*

Q. Are you listing many of your scientists to the United States?—A. No. We have a number on the British team who go back and forward in a temporary capacity but offhand, I cannot think of anyone whom we have lost to the United States in the last couple of years.

Q. I think it is a great tribute to the scientists at Chalk River. I have no doubt that many of them could command much higher salaries in the United States or in private industries here but they are doing a very fine and patriotic job for Canada.—A. I think it is also a tribute to the quality of the type of work that is being done there. Chalk River is the type of place at which scientists like to work.

The CHAIRMAN: They want to work at Chalk River because there are opportunities there which do not exist elsewhere. I think the suggestion is capable of the two answers and that the effort is not all patriotic.

*By Mr. Green:*

Q. One of them said to me "Oh, this is so exciting!"—A. If you want an overall picture, without knowing anything of the scientific details of the organization, you can look at the morale. Good people will only stay where there is a good show; so, if you want to judge whether this is a good effort, you may judge it that way. Morale at Chalk River is very high and the fact that people want to stay there is, I think, probably the best evidence that we can produce that the work going on is first class.

Q. Dr. Mackenzie, you suggested at one of the meetings that we might be able to help with regard to your community. Perhaps you have written us off as potential assistants in that direction?—A. I thought that, perhaps, you might be able to see something wrong with us in that regard. I realize that you do not know as much about nuclear energy as we do but with respect to the village, you are on your own playing field. You know as much about villages as we do. However, we think it is a pretty good village. If you can see anything wrong with it we would be very glad to hear about it. We do not expect you to be able to walk into a most intricate and scientific laboratory and see anything in a detailed way—I could not do that myself—but you can get general reactions as to the morale and as to the general overall appearance in the plant. In the village, however, you can go beyond that.

*By Mr. Pinard:*

Q. Would the housing difficulty in the village affect your personnel in any way? In other words, have you had any cases where scientists could not stay on account of the conditions?—A. It is usually a fact that to get the man we have to get a house for him first. People would like better things but when you get an enthusiastic group like that you are all right.

Q. In other words you do not lack personnel on account of that feature?—A. If we lost personnel on that account they would be of a type we would not want.

Mr. GREEN: There is one other thing I would like to clear up. Dr. Mackenzie said that the question of the agreement between the United States, the United Kingdom, and Canada, was a question of policy. Would it be possible for the chairman to find out from the minister whether there are any written agreements and whether they can be included in our records?

The CHAIRMAN: Yes, I will find that out. My own impression is that the whole relationship is not a matter of a written document; it has been a continuing and a developing thing. Perhaps the main lead on it was the Quebec conference from which point it has been a developing matter. I would be surprised if there were any documents spelling it out, but I shall pursue the question.

Mr. GREEN: Canada and the United Kingdom, apparently, have a very small portion of the information and for that reason it is to their interest that there should be some sort of an agreement.

The CHAIRMAN: I do not know of any written agreement. As you know, a committee sits from time to time—a policy committee—but if there is a written agreement I am not aware of it.

Mr. BREITHAUPt: Could you find out?

The CHAIRMAN: Yes, and I shall bring the matter before the committee at the next meeting.

Now, if the committee agrees, I would like to close the open meeting.